Sheil Sarda
ESE516
Assignment 2

What is the difference between recommended and absolute ratings?
Recommended ratings are the average case values of operating and environmental conditions. These values are used by manufacturers to compute estimated life, accuracy, or other metrics related to the product.

Absolute ratings are limiting values of operating and environmental conditions which should not be exceeded under the worst probable conditions. Stresses above those listed under Absolute Ratings may cause permanent damage to the device.

What is the maximum voltage you can apply to a pin on the SAM W25? What is the power supply voltage in that case?

VCC+0.30 = 3.6+0.3 = 3.9V

VCC (power supply for I/O) Power supply voltage in the max case is 3.63V

VBAT (supply for internal regulator and WiFi) Power supply voltage in the max case is 5V

For the SAMW25, what is the difference between the VBATT & VDDIO pins?

- I/O supply voltage (VCC) is applied to VDDIO and VDDIO_A.
- Battery supply voltage (VBAT) is applied to VDD_BATT_PPA, VDD_BATT_PA, and VBATT_BUCK.

The VBATT pins do not supply power to the SAMW21 MCU, only to the WINC. Presumably this is to provide the WINC with backup power in case power from the SAMWD25 fails as the WINC is transmitting data.

What voltage will you supply to these?

Characteristic	Symbol	Minimum	Typical	Maximum	Unit
I/O supply voltage	VCC	2.7	3.3	3.6	V
Battery supply voltage	VBATT	3.0	3.6	4.3	
Operating temperature		-40		85	°C

How much current do you anticipate to be drawn in the highest current draw situation?
13.5 mA (from the datasheet)

Pad Drive Strength (regular pads[1])	8	13.5	mA
Pad Drive Strength (high-drive pads[1])	16	27	

Note: 1. The following are high-drive pads: I2C_SCL, I2C_SDA; all other pads are regular.

Why might you want to use separate voltage sources for VBATT & VDDIO?

Sheil Sarda
ESE516
Assignment 2

We use VBATT to provide a clean voltage source to the ATWINC WiFi board, as opposed to WiFi drawing power from VDDIO. The VDDIO voltage fluctuates based on load of the various sensors which are connected via GPIO pins.

Also the WINC draws a lot of current compared to other components on the SAMWD25, so it might make sense to provide the WINC with a direct power source instead of via the SAMW21

How many reset lines are on the SAM W25? What does each do?
RESET_N: System Reset. Low level on this pin resets the entire module.
Wi-Fi Reset_n: Currently used only for Atmel debug. Not for customer use. Leave unconnected.

Given what you know about button debouncing & default pin states, what additional circuitry would you put on these reset pins? Note: include a physical button for manual resets.
To input a manual switch signal into a digital circuit, we need to debounce the signal so a single press doesn't appear like multiple presses. The basic idea is to use a capacitor to filter out any quick changes in the switch signal. We can use the circuit below on